GLOBAL PRODUCTION ENGINEERING

INTERNATIONAL BOOKLET FOR THE MASTER DEGREE PROGRAM
INTRODUCTION
Dear reader:

Addressing the challenges we face in this century will require highly qualified people with comprehensive problem-solving skills. The finite nature of earth’s resources will limit economic growth worldwide unless we are able to use creative solutions to close material cycles, to intensify our use of renewable raw materials, and to convert over the long term to energy from renewable resources. Forward-looking businesses need engaged and well-educated employees who understand these problems and who are ready to work toward these goals around the world.

Global Production Engineering’s two major study programs, „Manufacturing“ and „Solar“ have placed us in an ideal position to offer international students an excellent industry-related course of study on the way to an internationally recognized and respected degree in an active research environment. This means that we are able to solidly support the personal opportunities of our graduates by an innovative education coupled with very good contacts to the globally active industry and to an international network of alumni.

Berlin is a thriving metropolis in Europe. It is a place that combines multinatio- nality, tolerance, and research in a city that has not only produced 12 Nobel laureates, but also offers unmatched cultural variety.

It is our hope that this brochure will not only teach you more about the „Global Production Engineering“ course of study, but will also generate enthusiasm in you for Berlin and the people who live here. We look forward to the chance to meet you.

Sincerely,

Prof. Dr.-Ing. Günther Seliger
Dean
WHY GPE?
OPPORTUNITIES FOR ENGINEERS

Businesses, research facilities, and universities are being compelled to offer innovative, effective, and efficient solutions more and more rapidly in order to improve their competitive position in today’s increasingly global markets and to meet the demands of their customers. This is particularly true in the case of industry and technology-oriented businesses, which are often involved in international value-added chains.

If they are to succeed at this, they will need people who are innovators in the problem-solving process to drive technological development in a global environment. Ever more complex high-tech solutions require teamwork in global networks, where people collaborate with each other even as they compete with each other. Competence in technical solutions, economic knowledge and ecological and social behavior are skills that engineers and managers must have if they are to cope with these tasks.

Meeting the increasing demand for such highly qualified decision makers has necessitated the creation of new approaches to academic engineering education. A complete university education must include technical, management, and intercultural content taught using innovative methods of instruction, such as online learning and project-oriented teaching.

The “Global Production Engineering,” or GPE, course of studies was founded at the Berlin Technical University specifically to deal with these requirements. Since 1998, outstanding graduate students in the engineering sciences from around the world have been trained in production, engineering, management, and software skills in this Master of Science program located in Berlin.

GLOBAL PRODUCTION ENGINEERING

Global Production Engineering is a full-time four-semester course of study offered at the Technische Universität Berlin in Germany. The curriculum is designed for outstanding international graduate students seeking to improve their personal competence portfolio in the fields of production, management, engineering, and intercultural communication. The strong international orientation of our program can be seen in the fact that 95% of our students are natives of countries other than Germany. To date, we have entertained students from 43 different countries among our student body. Most courses are taught in English, giving students the option of taking all of their courses in the English language. The GPE course of study acquired an 8-year accreditation in 2007 from the ASIIN, a special accreditation agency for the curricula of engineering sciences, computer science, natural sciences, and mathematics. This accreditation reaffirms and expands the high standards and quality of the program. GPE currently offer two majors: Manufacturing and Solar. Manufacturing is the older of the two majors, introduced at the beginning of the GPE program in 1998. Solar was founded in 2007 as a way of developing technological potential in this area of international engineering education. The strong connection between the solar industry and the research institutes in Berlin and Brandenburg brings theory and practice together in one place. This research-oriented education with its quasi-practical application in labs and associated thesis work allows students to get an early start on assuming tasks bearing responsibility at the university and in research. In addition, the last ten years have seen the formation of a global network of alumni, where alumni exchange information and provide mutual support for each other. GPE graduates today are collaborating on challenges such as construction of the Shanghai subway, production of German automobiles, or in projects setting up sustainable factories in the Amazon rain forest.
The special international make-up of the GPE student body (composed of students from more than 20 different countries and 5 continents) that attends GPE every year is the hallmark of the program. This kind of special mix of students is rarely found in comparable programs. In courses designed to orient them toward working in the global village, students learn from each other on a daily basis how to develop ideas, come up with common solutions, and implement them. In this way, their educational training prepares them for intercultural teamwork with a changing mix of team members to deal with tasks under the tutelage of experienced instructors.

Several lectures with an international perspective are available, such as Global Supply Chain Management, Global Production Management, International Procurement and Technology Transfer. In addition, courses are offered in which GPE students carry out industrial and research projects with students from Korea, the USA, Brazil, and South Africa. Students take up the latest research developments. They open up new application areas for technologies or deductively analyze problems from industry on their way to developing solutions.

The TU Berlin infrastructure surrounding the GPE is sharply defined by the Production Technology Center (PTZ), which consists of departments from the TU Berlin and the Fraunhofer Gesellschaft. The PTC collaborates intensively with partners in research and in education from around the world. Its network of partners consists of roughly 200 businesses, research facilities, and universities worldwide. These partners jointly seek out engineering projects and scientific business questions from the production technical environment.

The international flavor of the student body and assistant professors plays a key role in the educational process. Every year, visiting professors give lectures for GPE; in recent years these have included professors from the University of Michigan, USA; the University of New South Wales, Australia; the Korean Institute of Science and Technology, Korea; the University of Cincinnati, USA; the Rochester Institute of Technology, USA; the University of Sao Paulo, Brazil; Hong Kong University of Science and Technology, China; Tongji University Shanghai, China; and Waseda University Tokyo, Japan.
QUALIFICATION

Our GPE graduates go on to assume leading positions as technology managers, functioning successfully in international value-added chains. The qualifications they acquire are directly taken from the job descriptions of technology managers in the global business environment. International cooperation between businesses demands engineers with the ability to cooperate and communicate globally. Science, research, and global industrial practices require that GPE graduates master the following skills:

The ability to understand, assess, and apply scientific, natural science, and technical interconnections when developing, maintaining, and improving construction and manufacturing products and processes. The ability to recognize and assess interrelationships between the economy, technology, the environment, and society. The ability to work independently and responsibly in intercultural multidisciplinary projects. The ability to place what they have learned in the context of economically, socially, and culturally different regions and to apply it there.

The GPE curriculum was designed with these requirements in mind, and has proven itself in the career experiences of GPE graduates. In addition, opportunities for interdisciplinary cooperation are enhanced by the research facilities involved in the program or through interdisciplinary research projects. These research facilities include the Fraunhofer society, the Production Technology Center Berlin, Helmholtz-Zentrum, and the Konrad-Zuse Center for Information Technology in Berlin.
Professor Seliger, you’re the Dean and co-founder of the Global Production Engineering (GPE) curriculum, created in 1997. What led you to found this course of study?

In collaboration with the DAAD (Deutscher Akademischer Austauschdienst), we hit on the idea of encouraging more non-European students to study in Germany. Our institution is very well suited to that, since we have a plethora of accessory resources and offer a first-class and internationally recognized engineering education. We have made great strides and have around 1,000 applicants annually, of which we are able to accept about 70 who meet all the requirements and bring all the essential qualifications with them.

What are some specifics you would emphasize in the organization of this curriculum?

Every year, we conduct a thorough survey of our students at every level so we can get into what changes are wanted in all the fields and thus continue to improve. Furthermore, we are redoubling our project-oriented efforts and have been able to significantly expand our connections to our industrial partners, so that we now have access to a considerable collaboration network. And, of course, we place strong emphasis on the city of Berlin itself: Next to curriculum, we focus on cultural development; we take our students to theaters and museums, we attend exhibits, conventions, and concerts and celebrate the holidays together.

Thus, in addition to professional qualification, GPE focuses strongly on integrating our students into our community. The “Manufacturing” track offered by GPE has found strong resonance in industry. What moved you to introduce the “New Energy Technologies“ major now?

The renewable energy industry, which has shown strong growth not just in Berlin-Brandenburg, but also throughout Germany, came to us and told us that they needed academic-technical leaders for their export markets, which already make up far more than 50% of their current business. So, we expanded our core competencies of engineering, lean engineering, management, and organization of the value creation process by adding an illustrious network in the solar and wind field, and now offer a major in “New Energy Technologies.” This network includes the Re-
newables Academy, the Helmholtz Institute, PV Manufactures, as well as a member Berlin Brandenburg based Solar industries engineering and business and clean energy financing consultants, only to name a view.

In addition to your position as Dean, you are also active as an instructor at GPE. Have there been difficult changes in the field of knowledge transfer?

Information technology has given us access to knowledge resources in a scope that would have been inconceivable up until 5 years ago. That leads to a situation where the pure transfer of knowledge becomes secondary to the mode of transfer, where the instructor communicating with the students is concerned. And the consequence of that in turn is that an intensified project orientation has to occur that we can focus on all of our academic content. However, industry demands on engineers have also changed. In the past, when they were problem-solving, engineers mainly had to link the dynamics of the analysis of the technical and social potentials. Now, however, the broad field of sustainability is taking on a massive amount of significance, something that we here at the institute have long been predicting. We used to be laughed at quite often for making this prediction, but we long ago reoriented our teaching functions to this topic and have become a pioneer in this area.

What role does the city of Berlin play for you as an instructor?

Berlin is a dream location for obtaining a wholistic education and offers conditions for me as an instructor that are unmatched almost anywhere else. Variety, innovative strength, and culture are dimensions that still have special meaning in Berlin. Combined with this city, there is no other production engineering institute like this anywhere else in the world linked with an excellence that is internationally respected and recognized. Students come to Berlin from around the world with great enthusiasm and joy, because they can combine international living with personal and professional qualification. In my opinion, Berlin is and has always been a global city with an eye to the future.
ALUMNI REPORT

“I am presently working with Cadbury India Limited as Development Manager in Logistic functions, implementing SAP-APO in the organization. I am heading the project. Officially it is the Master degree that I got for my studies, but really speaking, the course, the location (Berlin) and the students (multi-national) gave the best experience one could ask for. The city of Berlin has given me a lot of experiences which I will cherish throughout my life, the most important being when I submitted my final master thesis, it was a tribute to all the hard work.” ANUP MUDUGAI

“I am currently working for a German company here in Indonesia and quite often I have to deal with other subsidiaries around the world. Berlin is very attractive for foreign student, its international atmosphere as well as its reasonable living cost.” RUSLY WIRYANTO

“I started working as a management consultant at McKinsey and Company. In my studies I focused on logistics and supply chain management and realized this focus by taking courses in both, doing relevant internships (SCM at Continental and Logistics at Audi) and by writing my master thesis in a related topic. I chose this focus because it gave me the opportunity to have a good mix of operations and management content. Learning how to not only work in international teams but also how to develop deep personal relationships with people of completely different backgrounds was for me the most important aspect of working together with students from different nationalities and cultures. At McKinsey, where international teams are the norm, my experience at GPE has helped me immensely. It was undoubtedly the numerous parties hosted by co-students, Chinese, Mexican, Indian or otherwise which added a lot of color to the 2 years at GPE. GPE provides much better international exposure than any other master program which is extremely valued in the job market in Europe.” AJAY SOHONI

“I started my own consulting company in Mexico. Our main services are in areas of quality and manufacturing. Most of the skills learned during my GPE studies (Technical and soft skills) help a lot on my job. Berlin is a wonderful city and I had there several big emotional experiences, but the most important is that I met my wife in Berlin. The GPE is an excellent way to start an exceptional contact’s network.” JOSÉ MANUEL MARTÍNEZ LÓPEZ

“I joined ABB AG in China after GPE study, and after 2 years working there the company set me to ABB AG Germany for another interesting position. Berlin is a different city in Germany, it is not very German, but very international, not boring compared to other German cities, I like Berlin very much. In my mind, Berlin has the biggest number of football playgrounds, which I like.” YANG PEI

“I am working as Factory Manager in India in a Spanish Company.” SANDEEP CHAUDHARY

“After my graduation I moved to Miami, Florida in the United States. Here I am starting my own Business. I focused on Logistics. It was the most interested area for me. The Logistics Department was one of the most prepared and had more options and opportunities than any other department. Some of the activities that they offered were seminars, guest lectures, trips to different companies, a complete week of seminar and lectures from the most recognized companies such as BMW and Coca-Cola. For me the most important thing about studying abroad is to learn about other cultures and to get integrated in the whole globalization. Nowadays, you need more from other countries and cultures, and I believe you could get a great network and a great idea of the rest of the world when you study with people from other cultures.” CECILIA PANTIN
In the international arena German companies have an excellent reputation. They represent “Made in Germany”, known as a seal of quality the world over. They represent innovation, quality and cutting-edge technology. Yet the world’s fourth largest economy does not consist solely of global players such as Siemens, Volkswagen, Allianz, SAP and BASF, but also of many world market leaders who are actually small and medium-sized enterprises, the powerhouse of the German economy. Small and medium-sized enterprises are regarded as the backbone of the German economy. They all benefit from the sound economic conditions, not to mention the excellent qualifications of the workforce. Foreign investors also value this. Industry is an important pillar of the German economy – five million people work in industrial companies. In no other traditional economy does classic industrial production play a comparably major role. It contributes a significant proportion to the German economic output. The most important sectors of industry are automotive manufacture, mechanical engineering, electrical engineering and chemicals. These four sectors alone provide work for 2.9 million people, who generate sales worth in excess of EUR 800 billion. Automotive manufacture is the innovation engine room: Around 30 percent of all internal company spending on R&D is in this sector. With the six manufacturers VW, Audi, BMW, Daimler, Porsche (VW) and Opel (General Motors) Germany, alongside Japan, China and the USA is one of the largest car producers – with a significant share of the upper mid-range and luxury market segments.
The protection of the environment and climate is among the global challenges of the 21st century and is accorded a prime status in German politics, media and civil society. Germany is internationally considered one of the forerunners in climate protection and a pioneer in developing renewable energies. In 2011 Germany was the first industrial nation to decide to opt out of nuclear power. And the government assumes an active role in environmental protection, climate-friendly development strategies and energy partnerships at the global level, too. For years now, Germany has been following a course, which unites climate and environmental protection in terms of sustainable management. The key: to increase energy and resource efficiency and to develop renewable energies and raw materials. This promotes the development of new energy technologies both on the supply side, in power stations and renewable energy plants, and on the demand side, where energy is used. The measures in the Integrated Energy and Climate Protection Program do not only serve to protect the environment, but also to promote the development of an innovative future industry, which is a real job creator, is highly internationally competitive and increasingly active in foreign markets.

Germany sees itself as a pioneer in environmental and climate protection. With the goal it set itself Germany put itself at the very top worldwide: no other comparable industrial country has a similarly ambitious and concretely formulated program: By 2020 the Federal Government intends lowering greenhouse gas emissions by 40 percent compared with the 1990 level. Furthermore the use of renewable energies is to be consistently expanded and energy efficiency increased further. The goal is for renewable energies to become the major source of energy supplies.

www.tatsachen-ueber-deutschland.de
Berlin is both, the capital city of Germany and
one of sixteen German states. With a popula-
tion of more than three million people from
180 different countries, Berlin is Germany’s
largest city and attracts visitors from around
the world. In addition to the many political
institutions, the city is home to numerous
German and international associations, busi-
nesses, and media centers.

The city’s greatest natural resource is know-
ledge. Berlin possesses a research community
that is unique in Germany. In this “labora-
tory of ideas,” scientists from all over the
globe come together to develop technology,
processes, and products for the future. Berlin
has three universities, seven polytechnical
colleges, four arts colleges, and more than
60 non-university research institutions. This
includes facilities of the city of Berlin, such as
the Berlin-Brandenburg Academy of Sciences
(BBAW), as well as the Max Planck Institutes
and the institutes of the Fraunhofer Society.
130,000 young people study in Berlin. Fifty
thousand men and women are employed in
science and research in the city.

Berlin is a major center of European culture,
politics, media, and science. Its economy
is primarily based on the service sector,
ensuring a diverse range of creative
industries, media corporations, environmental
services, and convention venues; it also
serves as a continental hub for air and rail
transport. Berlin is the third most-visited
tourist destination in the EU. Other industries
include traffic engineering, optoelectronics,
information technology, vehicle manufactur-
ing, health care, biomedical engineering, and
biotechnology.

Home to world-renowned universities, re-
search institutes, sporting events, orchestras,
museums, and famous personalities, Berlin’s
urban landscape and historic legacy has
made it a popular setting for international
film productions. The city is recognized for
its festivals, diverse architecture, nightlife,
contemporary arts, and high quality of life.
Berlin has evolved into a global focal point for
young individuals and artists attracted by a
progressive lifestyle and modern zeitgeist.

www.wikipedia.org
-> Germany or -> Berlin
The establishment of the Building Academy in 1799 is generally regarded as the true birth of the Technische Universität Berlin. The Mining Academy, founded in 1770, and the Vocational Academy, founded in 1821, were also important predecessors of the present-day TU Berlin. The Building and Vocational Academies were combined in 1879 to form the Royal Technical College of Berlin. In 1899 it became the first technical college in the German Empire to be granted the right to award doctorates to engineers. In 1916 the Mining Academy was incorporated. One year later, professors with budgeted posts at the Technical College were given the status of full university professors. In 1922 the various divisions became faculties.

The darkest chapter in the history of the university began in 1933. The Berlin Technical College had become a center of Nazi activity, especially – but not exclusively – among the student body. In April 1946, with the support of the British military government in Berlin, the university re-opened its doors. A conscious decision was made not to simply re-open the Technical College, but to open a new university under a new name, the Technische Universität Berlin. The result was the creation of Germany’s first “technical university.” In an attempt to redefine the educational goals of the university, all students were required to include courses in the humanities as part of their studies, the intention being to broaden students’ horizons.

Today, the university offers a broad range of courses in the humanities and social sciences. The incorporation of the Berlin Pedagogic College has strengthened the role of the teaching profession at TU Berlin. As an engine for reform and invention reform legislation in the late 1960’s, TU Berlin brought fundamental changes to the internal organization of the university. The outdated structures of the traditional German university system were swept aside, and university members were given a greater role in shaping university policy. Twenty-one departments were established. A president replaced the traditional dean as head of a unified administration. University committees were made responsible for academic self-government. After a number of other changes, the number of departments fell to 15. In April 2001 these were again reorganized into seven faculties in order to exploit synergies and further develop TU Berlin’s profile.
The university has been home to many renowned scientists. Three-color photography and rotogravure printing were developed here. Research into motor vehicle design, radiotelegraphy, machine kinematics and early television techniques provided the basis for a number of modern technologies. Georg Schlesinger’s pioneering research into the interaction of machine tool design and factory management contributed to the development of ergonomics and biomedical technology. Ernst Ruska, who later won the Nobel Prize, built the first electron microscope at the Technical College of Berlin. Konrad Zuse constructed the first freely programmable calculating machine, a precursor of modern computers, out of spare parts.

The Center unites the Institute for Machine Tools and Factory Management and the Fraunhofer Institute for Production Systems and Design Technology under one roof.

The main thrust of the current reforms at TU Berlin has been to improve teaching and study conditions. The changes are governed by the “Guidelines for Further Development of Study Programs” adopted by TU Berlin’s Academic Senate in February of 2000. One of the goals of the measures has been to reduce study times in order to increase the attractiveness and competitiveness of the university degrees on the labor market. Another important goal is to enhance the international quality of the education offered at TU Berlin. For this reason, a growing number of international studies programs leading to bachelor and master degrees are being established. Modular course systems are being introduced to allow more flexible studies. This makes it easier to take part in international exchange programs, increases the freedom of choice regarding courses within the faculties, and encourages interdisciplinary studies. According to the guidelines, TU students are expected to devote 15 percent of their studies to disciplines outside their own fields.

The new budgeting system offers financial rewards for improving study conditions in the individual faculties.
Faculty V of Mechanical Engineering and Transport Systems draws together engineering disciplines such as mechanical engineering, transport technology, and social sciences such as psychology and ergonomics. The relationships between individuals, technology, and society provide a framework for many exciting areas in research and teaching in Faculty V. Human-machine interactions play an important role, especially in such fields as mechanical engineering, psychology, and transportation management. The drive to view complex systems in the context of their social, technical, ecological and economic ramifications is mirrored in the individual course programs. The development and construction of new products and processes for medical and microtechnology, for power and flow technology, and transportation technology depends on progress in creating new materials. Improved integration of mechanical and electrical components, together with control, information and production technologies, also plays a role. Information technology is taking on an increasingly important role in all engineering sciences.

Other specialties are in the areas of construction and production technology. For example, more than 50 scientists work together on the creation and mediation of innovative solutions dealing with resource efficient, green and social adequate industrial value creation, called sustainable manufacturing. Intensive research in cooperation with industry is also done on rail vehicles, as well as aircraft and aerospace systems. Scientists from TU Berlin were involved in the development of the high-speed magnetic railway Transrapid and the passenger aircraft Airbus successor A380.

www.iwf.tu-berlin.de
In 1904, the emperor of Germany, Wilhelm II, appointed Dr. Georg Schlesinger, age 30, to a professorship for Machine Tool and Technology and Factory Operation at the Königliche Technische Hochschule zu Berlin. Thus, Prussia was the first state in Germany to establish a professorship of this kind. Schlesinger is considered the pioneer of scientific organizations in Germany. His findings on questions of rationalization, standardization, interchangeable manufacture, and psychotechnology were based on a thorough study of the theories of the American manufacturing engineer F. W. Taylor (1856-1915).

In the subsequent years, the Königliche Technische Hochschule zu Berlin received a high degree of recognition at both national and international levels.

The Production Technology Center Berlin (PTZ) covers the Institute for Machine Tools and Factory Management (IWF) of Technische Universität Berlin and the Fraunhofer Institute for Production Plants and Construction Technology (IPK), both from 1965 to 1997 lead by famous Prof. Günter Spur. At the Institute of Machine Tools and Factory Management, the research and teaching programs focus on technology and management in industrial factory businesses today. These range from the development of process technologies and production plants to information technology. Scientists work at the „digitally-integrated factory“ in five departments.

The further growth of both institutes required a new building, which was acquired in 1986. Over 500 employees work in research, teaching, and industrial development here today. The central test field alone comprises 3,850 m², and the total area at our disposal equipped with the most modern machinery, computers, and software systems comprises a workspace of 15,000 m².

For their work, the architects Gerd Fesel, Peter Bayerer, Hans-Dieter Heckel, and Roland Ostertag won the German architecture prize in 1987. The PTC works intensively with partners abroad both in research and in teaching.

www.ptz-berlin.de
In recent years, GPE has invested heavily in the program’s software and hardware equipment to build a modern computer pool that can support students with the information necessary for successful study. In this context, the student workspace has been equipped with new computers and software for their courses. GPE students have access to the PTZ computer pool 24 hours a day. Every student receives an account, a home domain, and an e-mail address. Moreover, students have access to a wireless local area network in most of the buildings at the University for direct internet access. Students are provided with all the software needed to complete relevant homework assignments at the computer pool. Naturally, they can use their own laptops as well. The software consists of standard software as well as special simulation and modeling programs. Test equipment is well represented in the Production Technology Center. The following plants are available for research and measurement:

- Laser cutting plant,
- Rapid prototyping,
- CNC work center,
- Flexible assembly cell,
- Flexible dismantling cell,
- Various robots,
- High speed cutting (HSC) engines,
- Virtual reality laboratory,
- Climate and acoustics laboratory.
In 2004, the TU Main Library and several departmental libraries were combined to form the new Central Library, which opened in October of 2004 in the newly constructed library building in Fasanenstraße. The Building was named the „Volkswagen-Haus,” in honor of the fact that Volkswagen AG contributed Euro 5 million to its construction costs. Apart from the collections at the TU Central Library, this building houses the Library of the University of the Arts (UdK).

In this library, you will find the latest technology, extensive holdings from science and engineering, a wide range of specialized and general literature databases, a large number of computer workstations and multimedia terminals, and carrels and group study rooms – conditions ideal for efficient work. In addition, the library is a forum for communication, information, and get-togethers.

**Key Facts**

- Public floor area: 16,000 m²
- Total number of items: 3 million
- Volumes in open areas: 800,000
- Number of working/reading stations: 750
- Computer workstations (thin clients): 300

[www.ub.tu-berlin.de](http://www.ub.tu-berlin.de)
Prospective engineers in the field of renewable energies require above all, to build up their practical and theoretical competences in the fields of principles of energy generation through non-conventional sources, and the implementation of modern renewable technologies in household and utility-large scale projects. The goal of the training center is to demonstrate the functions of both individual elements as well as entire facilities for solar and wind technologies, thus giving students a consistent practical reference in their instruction. The training center is equipped with the most modern characterization equipment, measuring instruments, as well as state of the art software required for the development of renewable energies planning projects. It enables students to better understand the basics and principles behind the generation of energy though renewable sources and have physical contact with modern artifacts and devices commonly utilized at household and utility scale levels. The following practical training gear is available in the center:

- Workstations for determining the physical characteristics of solar cells (e.g. current-voltage curves, spectral efficiency, temperature effect, etc.)
- Solar cells made of different materials (amorphous and crystalline silicon, GaAs, CIS, etc.)
- A mobile solar charging station for E-bikes
- The most modern measurement equipment for recording performance characteristics of solar cells, functional models for solar thermal facilities
- Experimental kits for grid-connected, off-grid photovoltaic and solar thermal systems containing real-life system components
- A variety of solar thermal collector technologies (vacuum tubes and flat collectors)
- A mobile wind channel able to simulate diverse environmental conditions
- A mobile small scale wind turbine as well as characterization hardware/software
The Application Center for Micro Production Technology

Micro technology is considered amongst the most important technologies of today, due to ever rising demand for technological and mechanical micro system products. Modern machine tools are today capable of working with work pieces or on structure, that are small as 100 nanometres in size, which is equal to one-thousandth of the diameter of an average human hair. These small working dimensions require small work tools, furthermore, environmental influences have to monitored and controlled even more precisely than with other precision production technologies.

The Application center for micro production technology (AMP) is located in a 1,200 m² hall, superbly equipped for innovative research and development. The departments of Machine Tools and Factory Management (IWF) at the Technische Universität Berlin and the Fraunhofer Institute for Production Systems and Design Technology (IPK) have been working closely together in the field of micro production technology for several years now. This unique partnership of academic and applied research in new development, offers it competences in fields such as biotechnology, medical technology, optical technology and microsystems technology.
WHAT’S INSIDE GPE?
The vast majority of courses are taught by professors from TU Berlin and decision-makers from leading German companies. Thanks to its modularity, the structure of the teaching program allows a variety of content choices. The course program makes a conscious break from the one-dimensional approach to business management, the Master of Business Administration, and instead combines entrepreneurial and management-oriented content with approved engineering education. Students gain hands-on experience about global working cultures in teams made up of mixed nationalities, such as Brazilian, Chinese, Indian, Thai, and Turkish citizens. The general features of the curriculum derive from the variety of modules offered within the following module groups:

A Production  
B Engineering Sciences  
C Management  
D Intercultural Communication  
E Special Profile

The module group Special Profile has options for self-designing a program. Courses are inserted in the curriculum here with an actual reference to teachers from industry. Practice-oriented block courses are offered, such as Lean Production and Design For Six Sigma, on topics involving business organization. However, there is also room for project-oriented courses in this module group, such as Energy Entrepreneurship & Rural Electrification where, for example, energy supply concepts for developing countries are worked out. Students must take at least one course out of each module group. All the other courses can be chosen out of any module group, completing a total of 90 ECTS. The modularization of the curriculum gives the students the opportunity to build their own curriculum according to their interests or career perspectives. Understanding gained from international value-added chains in international partnership networks combines management capabilities with technical comprehension. This use of intercultural knowledge to perform professional activities as an engineer is a great advantage in the broad field of the technology management.
MAJOR IN MANUFACTURING

The GPE major in Manufacturing is designed for engineers from production operations who want to learn new technologies and master management methods within the scope of their Master Degree training. Most of the students already have professional experience. They have worked in businesses in the aircraft industry, aeronautics, or the electrical engineering industry, but also in completely different areas of value creation as planners and designers. A GPE education is designed to give students the capability to take on activities in production firms demanding a high degree of responsibility.

The training contents are oriented toward the state of the research and the requirements of professional practice. The theory of flexible, adaptable, and virtual factories is a major educational focus. Production planning and control, process-oriented factory layout, CaX programs and virtual design are all part of the mix. Designing global supply chains and factory management are key in the area of economics. IT tools for planning and designing products and processes are introduced, and students learn how to program and use them. The curriculum includes courses on how to work with enterprise resource planning software, such as SAP programs, computer-aided design programs such as Solid Edge or ProEngineer, and planning tools for modeling production facilities such as EM-Plant and AutoMod, and logistics chains such as AIMMS. Students may work as student interns in businesses based in the Berliner economy, such as Siemens or Bombardier, as well as in the Institutes of the Production Technology Center.

After completing their studies, graduates work as production planners and quality engineers, process planners, and product managers. In their positions, they take on leading roles in the automobile industry, the electrical and electronics industry, and in mechanical and facilities engineering.
Within the GPE-New Energy program, students are offered the opportunity to become experts in specific renewable energy technologies. From the design of elements, components and systems up to the evaluation of global markets and implementation potentials in specific world regions – every aspect of the value creation chain of relevant new energy industries is covered. This is achieved through an adequate knowledge transfer of the physical, electrical and mechanical properties of the main technological components, relevant production processes as well as through the analysis of current and future energy market trends on a global scale. Additionally, the modular structure enables the courses to be arranged flexibly according to students’ interests. The technical knowledge is complemented with courses on project management, financing, intercultural communication as well as policy and legal framework. Hot topics in the sector such as network integration and storage are also addressed.

GPE New Energy Technologies is not only unique for covering all the aspects related to the implementation of projects. The approach of this new master degree allows also students to choose whether they want to specialize in solar electricity generation (photovoltaic and solar thermal), or whether they prefer to have a wider insight in traditional renewable energies technologies (wind, geothermal, biomass, etc.) as core direction. The modular structure enables to arrange the courses according to the chosen core direction. To conclude, students have to undertake an internship of at least 9 weeks in one of the German renewable energy companies.

After completing their studies, graduates work as engineers, planners, builders, or product and process managers in designing and improving energy technology value-creation chains with an expertise in management of renewable energy projects. Graduates will be able to undertake projects not only from a technological perspective, but will have the legal, policy and economical background to make the right decisions on project management and businesses development in a multicultural environment. GPE graduates in the field of new energy technologies can work in the production industry, consultancy field, in the policy area, as well as at training and at research facilities.
COURSE CONTENTS

Our instructors prepare and teach current contents from research and practice in lectures and exercises as part of the GPE curriculum in the 5 module groups: Production, Engineering, Management, Intercultural Communication, and Special Profile. E-learning offerings and intensive practical application help students handle growing knowledge demands. The following is a brief overview of the course presentation contents:
MODULE GROUP A: PRODUCTION

• CAD Modeling and Collaboration in Engineering Design
  The aim of this module is to give students a basic insight into working with modern CAD systems, in particular direct and parametric modelling systems, and to prepare them for modern collaboration practice in product development processes. Engineering students are provided with knowledge, methods and tools for the process of virtually creating a product. The second part of the module is project-based. Project teams establish target specifications for a technical product.

• Manufacturing and Factory Planning
  deals with the special knowledge required to successfully plan modern factories. Students practice by developing technology-specific business fields. Supplementary skills in process chain-related analysis and design are taught internally and with a focus on several companies. The approach is based on an integrated customer-oriented creation of value processes in the competitive business environment.

• Production Technology
  builds basic skills associated with the development and operation of production plants. Students independently learn how to apply new technologies in advanced courses covering modern operating supply chains, a skill that today’s businesses expect from their technical executives.

• Joining and Coating Technology
  The lectures will focus on conventional joining processes, as well as on modern joining processes under laser beam with different crystalline, nano-crystalline and amorphous materials. These materials, which are associated with special and combined properties like high grade of hardness, high strength, and good corrosion resistance of the surface and suitable soft magnetic character compared to conventional crystalline metals. The tribological and corrosion damages besides crack initiation have their origin in the structure, topography and in internal stresses of the surface layer.

• Manufacturing of Solar Components
  focuses on the technology and manufacture of solar thermal components and solar cells. Students achieve a basic understanding of semiconductor technology and the photovoltaic effect, and are introduced to the latest silicon-based production technologies all the way from ingots and wafers up to cell and thin-film technologies, including the relevant requirements, advantages, and disadvantages.
Design and Installation of PV Systems

In this practice oriented seminar students will gain insights in all stages from design and installation to operation and maintenance, including the diagnosis of errors for grid-connected and stand-alone PV systems. The design stage comprises a site analysis including potential areas (surfaces, tilt angles) for the mounting of systems, and a valuation of prospective energy yields using suitable simulation software, adherence to standards and guidelines, static issues and a selection of components required for construction. Based on the design stage, grid-connected and stand-alone systems are installed and commissioned in the training centre.

Energy Engineering

Concentrates on modern methods used to analyze and assess thermal systems, principles of operation, and on how the most frequently used energy convectors are designed. In the laboratory, students learn to operate and assess the activity of internal combustion vehicles and gas turbines.

Utilization of Wind Energy

Wind Turbines or so called wind power plants are the most competitive renewable energies up to now. More than 273 GW installed wind power worldwide shows the importance of this technology and its market strength. The course teaches how wind power is produced and how it is converted into electrical or mechanical energy as well as its market potentials.

Mathematical Tools for Engineering and Management

Teaches mathematical modelling and problem-resolution techniques that help students gain a clear understanding of the quantitative side of engineering and management. Using innovative methods, students gain insight into restrictions caused by resources and budgets within the framework of market and technical forces. Course participants are encouraged to understand the essential mathematical techniques used in this field and to evaluate their suitability within specific business functions.

Energy Engineering
Prof. Dr.-Ing. George Tsatsaronis
tsatsaronis@iet.tu-berlin.de

Mathematical Tools for Engineering and Management
Prof. Dr. Drs. h.c. Martin Grötschel
groetschel@zib.de

Network Integration of Renewable Energy
Prof. Dr.-Ing. Kai Strunz
kai.strunz@tu-berlin.de

MODULE GROUP B: ENGINEERING SCIENCE
- **Network Integration of Renewable Energy** introduces students to the fundamentals of energy networks and different kinds of renewable energy sources. The technical aspects of energy sources are explained and students receive an overview of available options for electric power converters.

- **PV Systems** describes centralized PV system components, including basic photocell function, cell bandwidth, and differences between individual types of cells and their effects on efficiency. Additionally, students will gain insight into all stages of production, from design and installation to operation and maintenance, including troubleshooting grid-connected and stand-alone PV systems.

- **Solar Thermal Systems** provides an overview of the components in solar-thermal energy conversion systems, with an introduction and detailed explanation of the design, installation, function, key data, areas of application and specifications of individual component parts. Students are introduced to the full spectrum of solar-thermal system components, design and installation requirements, and learn how to judge their quality and potential areas of application.

- **Systematic Product Development** covers product planning and product development methodologies. Coursework provides students with a basic understanding of the structure of technical problems and products as well as construction guidelines.
MODULE GROUP C: MANAGEMENT

• Business Administration
The course objectives are to introduce the various management functions and roles in the contemporary business environment. Moreover it covers the various management skills required to cope with the modern day managerial job. Various theoretical concepts and frameworks will be discussed and applied with the help of case studies. The case studies will help the participants to have hands on exposure to the management theories and skills.

• Environmental Management
The goals are to gain applicable knowledge of elements of environmental management systems. The mastery tools for environmental management systems and the mastery of techniques for implementation of environmental management systems will enable students to design environmental management systems. The students will become motivated to environmental protection and to implement of environmental management systems.

• Global Production Management
covers integrated production management tasks such as planning, scheduling, and assessment of production processes and facilities. It also covers human resources and qualification, resolved by analysis and design, and based on reference models, products, and logistics.
• **Information and Communication Management**
With increasing requirements regarding functionality, quality and costs of IT services, the role of an effective and efficient IT service provisioning gains importance. The module provides students with a foundation in IT service management, enterprise resource planning (ERP), and the central components and the tools used. Students gain practical experience through first-hand experience challenges, cases studies and tasks related to the subjects.

• **Quality Management**
Teaches students methods and concepts associated with meeting quality targets at three levels: product, process and system. The target group is prospective executives. This lecture focuses on strategic methods for achieving quality-oriented optimization of construction and how to structure company operations. The accompanying exercises involve practical application through teamwork of the theoretical fundamentals learned by participants.

• **Renewable Markets and Business Management**
In this module students learn about important non-technical aspects for the successful implementation of solar businesses and projects. It gives an insight into solar-specific legal and contractual aspects, enables students to perform an economic analysis of typical solar projects and to set up suitable financing. Students identify success factors and barriers typical to solar markets worldwide and assess their potential.

---

**Business Administration**
MSc. Shahid Qureshi
quires.shahid@gmail.com

**Information and Communication Management**
Prof. Dr. R. Zarnekow
ruediger.zarnekow@tu-berlin.de

**Renewable Markets and Business Management**
Dr. Christine Wörlen
woerlen@arepo-consult.com
**MODULE GROUP D: INTERCULTURAL COMMUNICATION**

- **German for Engineers** is designed to help engineering students build the necessary technical language skills for work and everyday communication. This language course is an integral part of Intercultural Communication. Future engineers spend four classroom hours a week learning the German language. This prepares them for their six-month internship in a German company and possibly for later activities as well.

- **Project Management** The teaching module deals with Project Management as an instrument for the realisation of projects in the production environment. Students will be enabled to set up planning processes in projects, management of ongoing projects, learn how to use the instruments of risk- and quality - management for projects and how to set up communication and negotiation processes. They will be enabled to use the management instruments consequently.

- **Technology and Innovation Management** The module aims to provide engineering students with an understanding of the importance of innovation and technology in today’s society, stressing the importance of having a business strategy that propels technological innovation within the organization, regardless of the type of business. The module aims to provide students with the skills to formulate technological innovation strategies that are useful for organization for innovation, managing of new product development processes, managing of new product development teams and crafting of deployment strategy.

- **Technology Transfer** This teaching module informs students about different forms of technology transfer. Students get to know the political and social frame conditions for technology transfer and the description of the actors in technology transfer. They acquire competences in comparative research on factors for success and learn to apply methods of comparison and longitudinal section studies. Additionally, they become familiar with innovations by transfer and handle new relevant case studies in technology transfer oriented on problem solving.
MODULE GROUP E: SPECIAL PROFILE

The purpose of this module group is to provide a place in the curriculum to hold new events and offer new lectures by lecturers from outside the university. It also enables regular updating and continuous improvement of the teaching program.

• **Enterprise Architecture and IT in the Automotive Industry**
  This course deals with strategies for improving management coordination and organizational responsiveness with a focus on changing business processes. The lecture presents and discusses a top-down methodology for organizing, managing, and measuring organization in manufacturing industries. The wholistic approach is based on core organization processes, their IT business alignment, and the fundamental role of encouraging people within the transformation process.

• **Energy Entrepreneurship & Rural Electrification**
  Teaches students what power supply options can be introduced in regions with underdeveloped infrastructure, as well as investigating what these interventions could mean for economic and social development. The focus is on investigating available technical options, the existing energy infrastructure, the needed infrastructure, and the economic conditions of the region.

• **Strategic Standardization**
  This series of introductory lectures will cover the topic of standards and standardization from a holistic perspective integrating findings from the field of standardization research on the relation of standards and innovation, the role of standards in innovation policy as well as practical knowledge about standards, standardization and of standardization work into a coherent curriculum.

• **Environmental Management**
  Covers implementation of components of environmental management systems and the control elements used in environmental management.
• **Concentrating solar power (CSP)** technologies, utilize concentrated light focused onto a relatively small element to indirectly generate electrical power by means of heat. The CSP course, provides an overview of the related physical concepts, the various concentrating solar power technologies & components, and explores the technical and economic challenges to be taken into account when planning and installing thermoelectric power plants capable to deliver up to 1GW electrical power.

• **Global Engineering Teams** is designed to teach students how to apply their engineering competencies in global teams. Small projects with industrial partners are conducted by teams of 4-6 students from different universities. Objectives of the projects are improving technical products, processes, or services.

• **Simulation of Production Systems** covers the use of simulation as a method for analyzing and assessing business or production processes and facilities. Participants are trained in the efficient use of the technique “time-discrete event-oriented simulation.”

• **Solar Applications in the Built Environment** provides comprehensive information on ways to improve energy efficiency in buildings using solar technology. Students are introduced to architectural design, the history of energy-efficient building, and solar design concepts. On completion of the course, students will understand the needs and requirements of users and designers who are applying solar technologies in the built environment.
• **Thermal driven cooling**

Several residential and large scale cooling applications such as air conditioning and refrigeration can be made feasible by active thermal driven cooling devices and systems. Thermo-physical/chemical concepts of heat transfer, absorption & adsorption as well as relevant system components such as collectors, compressors, ab/adsorbers, desiccant systems and heat transfer means are part of this course which will additionally provide the student with an overview about current application fields and market.

• **Lean Management**

The Lean Production course conveys the principles of lean production by focusing on value-creation processes, the most important types of waste, and how value-added chains are designed. The course will teach students how to speed up business processes, improve quality, and cut costs in any industry. Students will learn and understand the concepts behind lean and be able to implement a basic-level lean management project.

• **TRIZ** deals with systematic product and process development, an area fraught with complexity and uncertainty, and a high degree of risk. Coursework includes working with universally applicable methods and models to produce constructive solutions and ideas for increasing the efficiency and effectiveness of project, technology, and management processes.
An internship lasting at least 9 weeks in a European company gives students the perfect opportunity to learn about new work environments. They come into contact with new working cultures, other technologies, branches, and organizational structures. Excluding their own cultural area, students may choose the country where they wish to complete this internship. Students can choose between rather application-oriented industry activities or research-oriented activities, depending on their interests. Mechanical engineering and electrical engineering companies in particular often request talented GPE students to serve as interns.

GPE publishes an admissions catalogue listing the curricula vitae of incoming students as a way of helping to advertise its students’ capabilities in solving problems in business environments. This catalogue introduces our highly prepared GPE students to companies and research facilities. This catalogue also helps many GPE students get in touch with companies and find a suitable internship or topic of interest for their Master Thesis.
MASTER THESIS

Studying production engineering in Germany is considered to be a high value competence in the global world of production. The deep ties that the departments of Machine Tools and Factory Management (IWF) has with the Fraunhofer Institute for Production Systems and Design Technology (IPK) and industries outside the university area create a framework that augments the incentives to study the GPE program even further.

The Master Thesis is the finishing touch on the study program. This is where students demonstrate how they can apply what they have learned. Furthermore, it enables the student to develop deeper knowledge, understanding and capabilities in research in the field of the student’s specialization. Students can choose between industry-oriented topic and a university topic. And in collaboration with an advisor, students analyze a problem and develop solutions building on that knowledge. Students have three months to complete the scientific work on their task. At the end of that time, the student presents its results to the sponsoring institute and possibly the company as well. Master theses by GPE students frequently receive awards from industry and research. They have often served as springboards for students into a career in global companies or research facilities.

EXTRACURRICULAR ACTIVITIES

Extracurricular activities form another strong part of the program. This is where student learning goes beyond the boundaries of the university. Activities include getting to know businesses, people, and art and culture as well. Exchanges with Germans, such as visiting the Philharmonic, theaters, and museums, take place regularly. The Hanover Fair, the international “Connecticium” job fair in Berlin, and visits to businesses such as Daimler Chrysler AG, Robert Bosch GmbH, Volkswagen AG, Siemens AG, E.on AG, Enercon AG or aleo and intersolar are all part of the program offered every year.

Each semester, GPE students regularly come together at events such as the Christmas and End-of-Semester Party, the Vabene Party, and alumni events as well. In addition, students have access to a day room at the Production Technical Center, where they can organize birthday parties, social evenings, or other events on their own initiative.
ALUMNI

Friendships made between students are often lifelong. Even in cases where career paths later scatter students across the globe, most remain fast friends. The GPE information system will help you keep in touch and build up networks with alumni from other classes. Publications like the TU International keep alumni informed of current events at the Technical University. Events such as the graduation ceremony with its ceremonial presentation of diplomas, the Christmas Party, and our annual alumni celebration are opportunities for the alumni to reunite and come together with younger students, the faculty, their university and all the memories they have had from Berlin.

The degree you earn during your studies will open doors for you to technology-oriented enterprises and organizations and will qualify you to found your own business. Our graduates can be found in small and medium-sized companies as well as major corporations like General Motors or Airbus. The majority of GPE graduates return to their home country to pursue their careers, while many others remain with companies in Germany for a few more years - and some stay on permanently. Alumni often tell GPE that their highly developed ability to communicate across cultures and cooperate in globally interacting supply chains is of immense value to them. But it’s not just industry that attracts GPE graduates - science-oriented students often find jobs at universities and research facilities. Personal interviews confirm that graduates with degrees from GPE more than meet the demands of the labor market. Salaries of GPE graduates in the first three years after graduation are significantly greater than their salaries earned as holders of bachelor’s degrees.
HOW TO APPLY?

ONLINE APPLICATION: WWW.GPE.TU-BERLIN.DE
APPLICATION PROCESS

To be eligible to participate in the program, you must have a Bachelor Degree or equivalent higher-level academic degree from an internationally recognized university in the field of engineering sciences. You must also have at least one year of professional experience as an engineer and hold a certificate of English language knowledge. The study program starts always in October.

Anyone interested in the program must apply online through the GPE website from October to March the following year.

An initial pre-selection is made based on the online application. For further evaluation, applicants may already prepare the following digital documents:

- Letter of Motivation
- Curriculum Vitae
- Diploma of bachelor degree or equivalent (certified translation into English or German)
- Final Transcript including all grades and courses (certified translation into English or German)
- Proof of English knowledge (Toefl/IELTS are accepted)
- Proof of at least one year professional experience as an engineer or related position.
- Knowledge of German is an advantage

Selection is carried out based on the application documents submitted by the applicants. Prospective students must apply through the GPE website from October 31st until March 31st. An initial pre-selection is made based on the online application. Applicants will be contacted by e-mail by the GPE team with information concerning the further steps to take on the application process.

The academic year begins in mid-October. The tuition fee for the full program amounts to 15,500 Euros, which may be paid in 4 installments. A semester fee of around 300 Euros for public transportation ticket and administrative costs has to be paid every semester. Living costs in Berlin amount to 750 Euros/month. Several scholarship opportunities are available:

Siemens scholarship: www.siemens-foundation.org
Third party scholarships: www.scholarships.com
DAAD scholarships: www.daad.de/deutschland/foerderung/stipendiendatenbank/00462.en.html
Other scholarships: www.auswaertiges-amt.de/EN/Infoservice/FAQ/Studium/02-Stipendien.html?nn=479790
ACADEMIC SUPPORT

The student body of approximately 120 students is supported by 15 professors from different departments at the TU Berlin, plus several lecturers who have close ties with the industry, having worked or working for global production companies.

The average class size is 20 students. Students are thus able to work individually and interactively during lectures and exercises. Getting involved in current research projects as student assistants gives students an insight into the current state of research, as well as the opportunity to earn a little money for their efforts.

GPE offers a pool of computers with internet access, Microsoft Office, and other special applications. Any computer programs required for coursework (CAD, ERP) will be provided by the University.

The GPE team consists of one program manager, one administrative coordinator, two administrative officers and three student assistants. Support during the application process and period of study covers:

- Support during the visa process
- Advice concerning health insurance
- Advice during application for scholarships
- Junior-Senior Program (pick up from airport upon arrival, finding accommodation support during TU Berlin registration)
- Introduction Event: welcome and two-day information session for new students, internship/job application training

Moreover, the GPE provides a welcome guide to give new students a head start on how to adjust to living and studying in Berlin before they arrive in Germany.

Research assistants from the department who are native speakers of Spanish, Turkish, Malay, Polish, Arabic or Chinese might be able to provide some assistance on the first days to ease the transition for new students.

Every first-year student (junior) is assigned a student from an elder intake (senior) at the start of the academic year. This senior student acts as an advisor and contact person for the first semester. The senior picks the new student up from the airport and provides support through any problems that might arise during the first days in Berlin. The junior-senior program fosters stronger cooperation between the students over the years, improves communication, and serves to strengthen the GPE student and alumni network.
GPE INFORMATION SYSTEM

The GPE information system database gives students, alumni, applicants, and teaching staff access to the world. This information system is used for a variety of tasks, including:

- Registering for examinations,
- Entering or obtaining examination results,
- Getting information about special events, trainee positions, and apprenticeship opportunities,
- Contacting students, attendees, and alumni,
- Planning and checking your individual curriculum,
- Researching current course schedules and times.

The information system has a forum area which can be used to download course syllabi and templates designed to simplify written correspondence with office staff and authorities. Another area in the forum provides students with company contacts, reports completed by interns on their experiences, and master theses of others students.

Every student receives his/her own e-mail account. This software-supported information and communication platform helps integrate students into college life at TU Berlin. For more information, go to:

www.gpe.tu-berlin.de
SUPPORT OFFICES
TU BERLIN

Foreign Relations Office
Strasse des 17. Juni 135, D-10623 Berlin
Tel.: +49 30 314-2 42 67
Fax: +49 30 314-2 52 34
E-mail: Sekretariat@abz.tu-berlin.de
www.tu-berlin.de/abz

International Office
Strasse des 17. Juni 135, D-10623 Berlin
Tel.: +49 30 314-2 46 94
Fax: +49 30 314-2 40 67
E-mail: auslandsamt@tu-berlin.de
www.auslandsamt.tu-berlin.de

General Counseling Office
Strasse des 17. Juni 135, D-10623 Berlin
Tel.: +49 30 314-2 56 06
Fax: +49 30 314-2 48 05
E-mail: studienberatung@tu-berlin.de
www.studienberatung.tu-berlin.de

University Library
Strasse des 17. Juni 135, D-10623 Berlin
Tel.: +49 30 314-2 66 06
Fax: +49 30 314-2 53 27
E-mail: sekretariat@ub.tu-berlin.de
www.ub.tu-berlin.de